

REMARKS

After entry of this Amendment, claims 1, 4 and 6-20 will be all the claims pending in the application. Claims 1 and 4 have been amended. Claims 2, 3 and 5 have been canceled.

Support for the amendment to claim 1 may be found in the specification, e.g., at the sentence bridging pages 6 and 7, and the second full paragraph of page 7. Support for the amendment to claim 4 may be found in the specification, e.g., at the sentence bridging pages 6 and 7.

No new matter has been added.

Entry of the above amendments is respectfully requested.

I. Specification

On page 2 of the Office Action, the Office Action reminds Applicants of the proper content of the Abstract. While Applicants consider the Abstract as filed to be sufficient, Applicants have presented a new Abstract which is submitted to be in further accord with the indication in the Office Action.

II. Claim Rejections - 35 U.S.C. § 103

A. On page 3 of the Office Action, claims 1, 12, 13, 15 and 17 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Petritsch et al. (U.S. Patent No. 6, 340,789) in view of Tanaka et al. (U.S. Patent No. 5,324,610).

In response, and while not agreeing that the rejection is correct, claim 1 has been amended to recite that the ionization potential of the electron transporting organic material is “5.8 eV or more.” Applicants submit that the combination of the cited documents, particularly Tanaka et al. at column 2, lines 46-48, do not teach or suggest that the ionization potential of the electron transporting organic material is “5.8 eV or more.”

Further, claims 12, 13, 15 and 17 are at least patentable over the cited documents by virtue of their dependency from claim 1.

Withdrawal of the rejection is respectfully requested.

B. On page 5 of the Office Action, claims 2, 3, 14 and 16 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Petritsch et al. in view of Nakaya et al. (U.S. Patent No. 5,792,557).

Initially, Applicants submit that claims 2 and 3 have been canceled, rendering the rejection moot for these claims. Applicants traverse the rejection for the remaining claims for the following reasons.

Applicants submit that that the description at col. 10, lines 47-52 of Nakaya et al. merely disclose that the difference in ionization potential between a hole transporting layer and an electron transporting layer is at least 0.25 eV. However, this disclosure of Nakaya et al. is not limited to the case where the ionization potential of the electron transporting organic material is larger than the ionization potential of the hole transporting organic material as recited in present claim 1.

Further, the maximum difference in ionization potential disclosed in the working examples of Nakaya et al. is at most 0.29 eV. Since present claim 1 recites the difference in ionization potential of “0.6 eV or more”, Applicants submit that the cited documents in combination do not teach or suggest each and every limitation of present claim 1.

Additionally, Applicants submit that the present invention yields unexpectedly superior results with respect to the difference in ionization potential of “0.6 eV or more”. These unexpectedly superior results can be seen from the results shown in Table 3 of the present application. Table 3 shows embodiments which use Compound E (ionization potential of 5.8 eV

as described in Table 2) as a hole transporting material and the compounds shown in Table 3 as a electron transporting material, respectively. As seen from the comparison between the quantum efficiency results of Compound D (ionization potential of 6.3 eV, resulting in a difference in ionization potential of 0.5 eV over Compound E) and Compound 21 (ionization potential of 7.5 eV, resulting in a difference in ionization potential 1.7 eV over Compound E), the quantum efficiency of the embodiment using Compound 21 (i.e., 42%) is much superior to that of Compound D (i.e., 31%). Therefore, when the difference in ionization potential is 0.6 eV or more, the unexpectedly superior results of present claim 1 can be obtained.

Further, claims 14 and 16 are at least patentable over the cited documents by virtue of their dependency from claim 1.

Withdrawal of the rejection is respectfully requested.

C.. On page 7 of the Office Action, claims 1 and 4 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Petritsch et al. in view of Tanaka et al. as applied to claim 1 above, and further in view of Stossel et al. (U.S. Patent No. 7,223,484) as evidenced by Asfandiarov et al.

In response, and while not agreeing that the rejection is correct, claim 1 has been amended to incorporate the features of claim 5. Applicants submit that the combination of the cited documents do not teach or suggest the compound represented by formula (I) which has a hetero ring group where at least two aromatic hetero rings are condensed to each other.

Further, claim 4 is at least patentable over the cited documents by virtue of its dependency from claim 1.

Withdrawal of the rejection is respectfully requested.

D. On page 9 of the Office Action, claims 1 and 5-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Petritsch et al. in view of Tanaka et al. as applied to claim 1 above, and further in view of Kimura (U.S. 2003/0072965).

Initially, Applicants submit that claim 5 has been canceled, rendering the rejection moot for this claim.

In response, and while not agreeing that the rejection is correct, claim 1 has been amended to recite that the ionization potential of said at least one electron transporting organic material is larger than said ionization potential of said at least one hole transporting organic material by 0.6 eV or more. Applicants submit that the combination of the cited documents do not teach or suggest this feature of present claim 1 and therefore, a *prima facie* case of obviousness has not been made.

Applicants also traverse the rejection for the remaining claims for the following reasons.

Applicants submit that the present invention yields unexpectedly superior results with respect to the difference in ionization potential of "0.6 eV or more," as required in present claim 1. These unexpectedly superior results can be seen from the results shown in Table 3 of the present application. Table 3 shows embodiments which use Compound E (ionization potential of 5.8 eV as described in Table 2) as a hole transporting material and the compounds shown in Table 3 as a electron transporting material, respectively. As seen from the comparison between the quantum efficiency results of Compound D (ionization potential of 6.3 eV, resulting in a difference in ionization potential of 0.5 eV over Compound E) and Compound 21 (ionization potential of 7.5 eV, resulting in a difference in ionization potential 1.7 eV over Compound E), the quantum efficiency of the embodiment using Compound 21 (i.e., 42%) is much superior to

that of Compound D (i.e., 31%). Therefore, when the difference in ionization potential is 0.6 eV or more, the unexpectedly superior results of present claim 1 can be obtained.

Further, claims 6-11 are at least patentable over the cited documents by virtue of their dependency from claim 1.

Withdrawal of the rejection is respectfully requested.

E. On page 17 of the Office Action, claims 1 and 17-20 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Petritsch et al. in view of Tanaka et al. as applied to claims 1 and 17 above, and further in view of Iwasaki (U.S. 2003/0209651). Applicants traverse the rejection for the following reason.

Applicants submit that Iwasaki does not make up for the deficiencies of Petritsch et al. and Tanaka et al. with respect to the recitation in present claim 1 that the ionization potential of the electron transporting organic material is "5.8 eV or more," and therefore the combination of the cited documents do not teach or suggest each and every feature of the present claim 1 and 17.

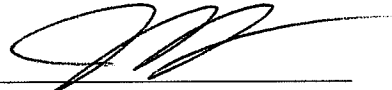
Further, claims 18-20 are at least patentable over the cited documents by virtue of their dependency from claim 1.

Withdrawal of the rejection is respectfully requested.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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